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Interaction of puroindolines with wheat flour polar lipids determines their  
foaming properties.

Dubreil L; Compoin J -P; Marion D  
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ABSTRACT: **Puroindoline**-a and **puroindoline**-b are two  
lipid-binding proteins that have recently been isolated from wheat  
endosperm. They have good foaming properties and can prevent  
lipid-induced foam breakdown in a protein system. This paper reports a  
study of the binding of these proteins with wheat lipids, and the  
foaming properties of **puroindoline**-lipid mixtures, in order to  
assess their potential application in breadmaking. The results  
indicate that puroindolines could play a major role in the formation  
and stability of bread **dough** foams.

SECTION HEADING: CEREAL PRODUCTS

DESCRIPTORS: APPLICATIONS; BREADMAKING; **DOUGH**; FOAM STABILISING  
AGENT; LIPID BINDING AGENT; PROPERTIES; **PUROINDOLINE**

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Interactions of puroindolines with wheat flour polar lipids determines their foaming properties.

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ABSTRACT: The interaction of puroindolines with wheat polar lipids and the stability of the corresponding **puroindoline** foams were investigated. Whereas **puroindoline-a** is capable of binding tightly to both wheat phospholipids and glycolipids, **puroindoline-b** interacts tightly only with negatively charged phospholipids and forms loose lipoprotein complexes with glycolipids. Both ionic, hydrogen, and hydrophobic bonds contribute to the stability of **puroindoline**-polar lipid complexes, and the integrity of tryptophan-rich domain is essential for the interaction with neutral polar lipids. Compared with egg white proteins, chosen as a model of nonlipid binding and good foaming food proteins, puroindolines exhibit excellent foam stability, especially in the presence of wheat polar lipids. The higher efficiency of **puroindoline-a** than **puroindoline-b** to prevent foam destabilization by wheat polar lipids highlights the close relationships between lipid binding and foaming properties of these wheat proteins. These results indicate that puroindolines would be good candidates to play a major role in the formation and stability of bread **dough** foams.